Die Prognose der Schweine Preise. by Arthur Hanau
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Journal of the American Statistical Association, Vol. 23, No. 162 (Jun., 1928), pp. 205-208
Published by: American Statistical Association
Stable URL: http://www.jstor.org/stable/2276902
Accessed: 14/06/2014 20:48

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REVIEWS

Die Prognose der Schweine Preise, by Arthur Hanau. Vierteljahrshefte zur Konjunkturforschung, Sonderheft 2. Berlin: Reimar Hobbing. 1927. 41 pp.

It has been evident for some time that while the British school of statistical pioneers, notably Pearson, Bowley, and Yule, forged the first weapons of statistical investigation, American economists have led the way in putting them to practical use in economics. Of course our superior resources in the way of basic series of data, clerical help, and mechanical equipment, should not be overlooked as contributing causes. This practical application led American workers to make many improvements in the analyses of time series and in the study of relationships, and both the quality and quantity of statistical research in economics have been constantly growing. It would now appear that European investigators have conceded the initiative in this field to American workers, since during recent years economic research institutions have been established in Great Britain, Germany, and Russia, modeled quite closely after American examples. The work of these European research bureaus has been mostly devoted to describing the general economic situation through the development of basic data, the construction of indexes of price and production, the analysis of series into seasonal, trend, and cyclical elements, and the study of the relations and sequences of the movements of the several series. Until this paper on hog prices appeared, however, no European investigator, so far as I am aware, had attempted to apply to the analysis of the price of an individual commodity the methods of price analysis and statistical price forecasting which have been developing in this country for some years—methods which are far removed from the first British explorations in this field. Herr Hanau has done a job of analysis and forecasting which reflects great credit on him, not only as the pioneer European worker in the European field, but as producing a contribution which ranks very well when compared with contemporary work of the same type in this country.

The author has grasped the possibilities and limitations of the methods very well. His statement of the philosophy of price forecasting is worth repeating: "The goal is the investigation of the causal connections, so that, from simple subsequent occurrences of the established causes, conclusions can be reached as to indicated future effects."

The study of Berlin hog prices shows (1) that prices are determined largely by changes in market supplies; (2) that changes in the relation of hog-feed prices (40 per cent potatoes and 60 per cent grain) to hog prices, forecast changes in supplies by 18 months; and (3) that changes in the number of sows on farms also forecast changes in supplies by 12 months. Using the last two factors, and also the feed-hog price ratio, in a multiple correlation analysis, the author found he could forecast monthly hog prices 5 months ahead, with a multiple correlation of 0.86 for the prices corrected for trend and seasonal, or 0.94 for the actual prices themselves. This result for the period 1896 to 1913 is as good as any American student of hog prices has been able to obtain for the same period in this country. (Haas' comparable figure was $R=0.93$.)

The details of his analysis have been admirably abstracted in a Danish review, which I cannot improve upon, and am therefore quoting:

> The author, taking into consideration the special conditions in Germany, used as "feed unit price" the price for a feed consisting of 60 per cent grain and 40 per cent potatoes. The price relation between hogs and feed is then determined by dividing the current hog price by the "feed unit price" prevailing at the same time, taking into account a 12-month moving average for hog prices as well as for feed prices, in order to eliminate the incidental small irregularities in the monthly averages. The result of this investigation appears in a figure, which demonstrates the connection between the "ratio" and the supply 18 months later. In the years previous to 1904 this interval of 18 months is not as suitable as in later years, which obviously is due to the fact that the time for fattening has been shortened. It can consequently be stated that 18 months after the favorable price relation has occurred there will be large supplies and 18 months after a poor price relation there will be a small supply. Since the period of gestation is 4 months and fat hogs in Germany reach an average age of 10–11 months before they come on the market this difference of 18 months in time is easily explained. A few months have to be added because the farmer delays adjusting production in accordance with the price relation.
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> Since supply and prices are closely connected with each other, one can therefore draw conclusions from the price relation between hogs and feed not only as to the future supply, but also as to the future hog prices. Even though the curves in the figure show very clearly a close connection between the price relation and the future supply it must not be forgotten that different conditions can enter in and influence the farmer's inclination to adjust production according to the price relation. In the farming business hogs have to compete for the available feed stuffs, on an equal footing with other domestic animals, cattle and sheep, together with the possibility of the sale of feed stuffs produced on the premises. For this reason it is desirable to find other factors to support price forecasting, and the change in the number of sows over one year appears as a specially serviceable factor. The investigation has shown that the trend in the number of sows is a sure indication as to the direction hog prices will take in the next year. In a figure the fluctuations for hog prices during the period surveyed are compared with the fluctuations in the number of sows in such a manner that the price movement at a given period of time is placed opposite the movement in the number of sows one year earlier. It can therefore be recorded that if the census of sows shows an increase as compared with the number in the previous year, hog prices will fall during the period until the next census; conversely the same.
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> While it is thus actually possible to undertake a forecast of hog prices on the basis of price relation between hogs and feed alone and on the basis of the movement in the number of sows, alone, still the author, through his investigations, has come to the conclusion that the safest forecast, the best prognosis, is reached by connecting the two factors with a third factor: the absolute feed price. This combination can also be expressed in a mathematical formula (forecasting formula), by the use of this formula the author has been able, on the basis of material available at least 5 months previous, to "forecast" prices during the period 1896–1913 with a startling conformity, as is shown in a figure.[1]

Applying the same regression equation to data since 1924, Hanau found it possible to work out a forecast of hog price changes 11 months ahead of the last date used in the computations. On this basis he presents a forecast for 1927, worked out in February, which now proves to have been rather remarkably accurate. The forecasted prices together with the prices which actually prevailed (the latter based on information furnished by the Foreign Section of the United States Bureau of Agricultural Economics), are as follows:

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[1] *Landbrugsraadets Meddelelser*, October 20, 1927. "En tysk Undersögelse af Produktions-og Afsaetningsforhold for Svin og en Metode til Forudsigelse af Svinepriserne i Tyskland." I am indebted to Miss Ingeborg S. Erönbold, of the Bureau of Agricultural Economics, for the translation from the Danish.

PRICES OF HOGS AT BERLIN, 80-100 kg.

Month	Forecast price	Actual price
1927	RM per 100 kg.	RM per 100 kg.
March	114	120
April	109	115
May	107	113
June	108	118
July	117	122
August	127	133
September	131	143
October	131	133
November	127	124
December	124	113

While the actual price did not go quite so low as the forecasted price in the spring, and went lower in the fall, the general movement through the year, and the months of highest and lowest price, were indicated quite well. On the other hand, the failure to agree during the year seems to bear some relation to concurrent changes in the hog situation in the United States, and throw some doubt on the correctness of the author's conclusion that hog prices in Germany are practically independent of the hog situation elsewhere.

Certain of Herr Hanau's conclusions agree remarkably with those reached from parallel American investigations. Among these might be mentioned (a) that the mere size of the feed crop (potatoes) alone does not affect subsequent hog prices; (b) that cattle prices have little effect upon hog prices; (c) that the prices for pigs and light hogs vary concurrently with fat hog prices, instead of preceding them; and (d) that so far as hog prices are concerned, variations in demand are entirely overshadowed by variations in supply.

One conclusion might be questioned: That the German hog prices are practically entirely determined by German production, and that the not inconsiderable volume of imports is insufficient to affect the market. While it is possible to explain most variations in German prices by German conditions, the author has overlooked the point that supplies of hogs in Germany, responding to the hog-feed-hog-price cycle there, tend to vary at just about the same times that supplies of hogs in the United States change in response to changes in the corn-hog cycle here. Between 1900 and 1914 every major movement in Berlin hog prices was paralleled by a similar swing in Chicago hog prices, American prices tending to lag a few months; and every cyclical swing in German hog marketings was paralleled by a similar swing in our marketings. The phenomena are so closely parallel that the situation in either country may be fairly well accounted for on a domestic basis, yet a complete explanation would probably include the variations in the rest of the international hog market as well as in the particular country. The irregularities in the Berlin prices during the past year as contrasted to the forecast, which were noted before, and similar difficulties in forecasting hog prices in this country largely on the basis of our domestic conditions, all point to the mutual dependence of both markets and the necessity for bringing the entire situation within the forecasting equation.

Herr Hanau has made a valuable contribution to the field of price analysis, and one which should stimulate workers in this country to fresh efforts in the field of the international dependence of commodity prices.

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The Economics of Instalment Selling; A Study in Consumer's Credit, with Special Reference to the Automobile, by Edwin R. A. Seligman. New York: Harper and Brothers. 1927. Two vols. xii, 357, and 623 pp.

The economist, the merchant, the banker, the consumer, and the moral philosopher as well, has each had his view and at times said his say on the subject of instalment selling. Professor Seligman in his ambitious two-volume work has not avoided the issues raised by all of these observers and spokesmen. In his undertaking he has been aided, as he states in his preface, by a number of his professional colleagues, and a corps of younger assistants and has had put at his disposal the "complete records" of General Motors Corporation and the General Motors Acceptance Corporation.

The first of the two volumes gives the setting of the problem, states the issues and discusses them; the second is a volume of statistical appendices, the conclusions and summaries of which are called upon as occasion demands to support the argument of Volume I. This second volume consists of seven separate studies, five of which were individually conducted by colleagues of the author. These studies cover an interesting range. Instalment selling in real estate; the volume of retail sales; consumer credit; instalment selling in certain lines of merchandising; the effects of instalment selling of automobiles; repossession of automobiles sold on instalments; the effect of a depression on instalment sales payments—these phrases state the themes of the volume. The studies differ considerably in difficulty, in method of approach, in available facts, in type of analysis, and in style of presentation. There appears to be throughout a careful effort to point out the possible deficiencies and limitations of the data. The variety of problems faced and the methods used make Volume II worth the careful attention of statisticians.

One important statistical study is presented in Volume I. This study is undertaken to measure the volume of instalment selling. The author concludes that the selling price of so-called consumption goods represented by instalment paper is about 4.5 billion dollars per annum and that the average amount of outstanding instalment paper is approximately 2.067 billions. These figures are strikingly smaller than those presented about a year and a half ago by Milan V. Ayres, with which the author carefully compares them, and which indicated that yearly instalment sales ran close to 6 billions.

The major function of Volume I, however, is to present the case of instalment selling. The problem is stated as a series of problems centering around consumer's credit. First of all "what is consumer's credit?" Is it a direct outcome of earlier types of credit? Should all forms of consumer's credit be lumped